

## REMARKS

The Office Action dated May 21, 2003, has been carefully considered. In response thereto, the present application has been amended in a manner that is considered to place it into consideration for allowance. Accordingly, reconsideration and withdrawal of the outstanding Office Action and issuance of a Notice of Allowance are respectfully solicited.

The Applicants respectfully traverse the rejection of claims 1-41 under 35 U.S.C. §112, first paragraph, on the ground that the originally filed specification allegedly does not support multiple conversion processes. In support of that ground of rejection, the Office Action alleges that only one example of an output format, PDF, is given.

The Applicants respectfully disagree for two reasons. First, PDF is not disclosed in the originally filed specification as the only output format; in fact, the next sentence after the passage cited in the Office Action reads, "Note there are many suitable image formats." Second, even if PDF were the only disclosed output format, a single output format would still not imply a single conversion process. The originally filed specification teaches on page 7, lines 11-12, that the "original attachment is ... opened using standard Windows application processing supplied by the client ...." That inherently means that a Word file would be opened in Word, an Excel file in Excel, etc. A person having ordinary skill in the art would have understood as much as the time the application was filed. Thus, multiple conversion processes are supported.

For the reasons set forth above, the Applicants respectfully submit that the present application complies with 35 U.S.C. §112, first paragraph.

Further, the Applicants respectfully traverse the rejection of claims 1-41 under 35 U.S.C. §103(a).

All grounds of rejection under 35 U.S.C. §103(a) rely on the newly cited patent to

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*Kellum*. Superficially, the process of *Kellum* resembles some aspects of the present invention. The reference teaches the use of an intermediate device between protected systems and external systems to convert data signals from executable to non-executable formats.

However, *Kellum* performs that operation in a different manner from the present claimed invention. More specifically, *Kellum* emphasizes a signal-level process that operates below the software layer of a system (see, e.g., column 11, paragraph beginning at line 32). Examples of such a signal-level process include the use of a television card or a facsimile machine. In other words, *Kellum* fails to teach or suggest application-level conversion and in fact teaches away from it.

*Kellum* describes what is essentially a unidirectional signal-level conversion from one data transport format to another. Any semantics of the data and its interpretation by a human or machine recipient are not considered. Specifically, the transformation from one transport mechanism to another is not intelligent. It relies on attributes inherent in the transport media to retain or discard information, rather than relying on an active computational process to interpret the data and remove unauthorized code or repurpose it into a safe form.

The following analogy illustrates that point. Suppose that instead of making an electronic communication safe from malicious code, the task is to make an apple safe from worms. The brute-force approach of taking an apple, mashing it through a strainer, then reforming the "goo" manually into an apple-like shape is sufficient to remove any foreign objects (i.e. a worm), and it would be functionally equivalent to what *Kellum* describes. Nonetheless, when the *Kellum* conversion is finished, the user is left holding something other than an apple. The *Kellum* methodology grinds everything to a virtual data paste and reformulates it in some new (possibly unintelligible or inedible) form.

On the other hand, the application-level conversion of the present claimed invention retains the original human-readable semantic content. The process begins with an apple and ends up with an apple, or at least enough of an apple so that the user will not bite into an apple with a worm in it, yet it still looks, smells, and tastes like an apple, rather than apple sauce.

Second, the present claimed invention uses one of a plurality of software-level conversion processes selected in accordance with a type of the e-mail message. *Kellum*, on the other hand, makes no such distinction, converting everything carried by the transport medium into the new transport format. Thus, *Kellum* may possibly retain some data and possibly lose some data, with no way to gauge accurately what happened to the original semantic content. To continue the analogy above, the present claimed invention recognizes an apple as an apple, an orange as an orange, and a chicken cutlet as a chicken cutlet and processes them accordingly, while *Kellum* does not.

Third, *Kellum* operates at levels equivalent to basic hardware signals, relying on this signal conversion analogy to render any harmful data inert by nature of the conversion process. Unfortunately, that process is just as likely to result in data that is unintelligible to humans as not. For instance, a *Kellum*-based system could be implemented to convert phone conversations into printed sonograms, scan them back into a computer, reconstitute a data stream from the scanned sound data, and replay the audio. But if the converted phone call were a modem conversation, the *Kellum*-described conversion might actually still retain any malicious data imbedded in the original phone signal, assuming the conversion process retained sufficient resolution in the data. Conversely, if the phone call were human speech, it might lose enough information in the conversion process to become unintelligible or result in enough loss of information (e.g., the unique sound of a speaker's voice) that identity couldn't be confirmed.

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The *Kellum* methodology only works for a very small subset of transformations (e.g., text data to printed paper text, image data to video, etc.) on underlying transports and will fail for many classes of data carried on that transport while working for others. Since the *Kellum* patent makes no distinction concerning the semantics of the data being transformed, it can only succeed if it also allows false positives or destroys desirable data on occasion.

On the other hand, the present claimed invention is fundamentally different in that it does not care about issues at the protocol level and below. Because it uses application-level conversion processes, it is directed specifically at the application layer of the ISO stack and deals with the interpretation of and security for human and computer readable data as represented in electronic messages, attached data, and data and files in the local operating system. Its transformations are tied to the specific data format of the incoming message and its associated attachments. Accordingly, the present claimed invention avoids the drawbacks of *Kellum*.

To summarize:

*Kellum* fundamentally alters data by altering the underlying transport mechanism, assuming this alteration also renders any embedded malicious data inert. This makes sense for simple teletype style messages where executable data may be embedded in the data stream, but not visible to the reader of a message. It fails for most other types of data because there is only a small, finite set of transformation pairs for which data semantics can be retained even though data structure is destroyed.

By contrast, in the present claimed invention, as much human or machine readable semantic content is retained as possible by applying data format specific conversions to the data, independently of whatever transport mechanism is being used.

There is theoretically an infinite number of data format and transformation pairs that the

present claimed invention implements, allowing appropriate transformation of any data type, independent of transport. The number of data format and transformation pairs is, as a practical matter, limited only by the capabilities of the application-level conversion processes.

*Kellum* operates at the signal level, or the signal level equivalent in a higher level protocol. It performs no interpretation of the signal or data transported on the signal, and relies on a dumb remapping of transport media to achieve its function

The present claimed invention is transport independent and operates based on the interpretation of data and semantics delivered to it at the application level. It is transport media independent and can perform an at least theoretically infinite variety of transformations based on the data presented to it and the rules it is instructed to operate with. It is an intelligent process that can operate in the presence or absence of an underlying system implementing *Kellum*.

Thus, the present claimed invention offers a technique wholly different from that of *Kellum*, with advantages over *Kellum* in terms of greater flexibility in conversion of a wide variety of data types while preserving the semantic content.

None of the other applied references overcomes the above-noted deficiencies of *Kellum*. Therefore, the present claimed invention would not have been obvious over any of the combinations of references applied in the Office Action.

Finally, the Applicants respectfully note that claims 42 and 43, added in the previous Amendment, have not been considered in the body of the outstanding Office Action. The Applicants respectfully submit that due consideration be given to the subject matter of claims 42 and 43.

As all grounds of objection and rejection have been addressed and overcome, the Applicants respectfully request reconsideration and withdrawal of the outstanding Office Action

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and issuance of a Notice of Allowance of claims 1-43 as now submitted.

In the event there are any questions relating to this Response or to the application in general, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that prosecution of this application may be expedited

Please charge any shortage of fees or credit any overpayment thereof to BLANK ROME LLP, Deposit Account No. 23-2185 (109933-00103). In the event that a separate Petition for an Extension of Time does not accompany this submission or does not suffice to render this submission timely, the Applicants herewith petition under 37 C.F.R. §1.136(a) for an extension of time for as many months as are required to render this submission timely. Any fee due is authorized above.

Respectfully submitted,

Walter Mason STEWART et al.

By: 

David J. Edmondson  
Reg. No. 35,126

BLANK ROME LLP  
Watergate 600, 11<sup>th</sup> Floor  
600 New Hampshire Ave., N.W.  
Washington, D.C. 20037-2485  
Phone: (202) 772-5800  
Fax: (202) 572-8398

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